ABSTRAK

Hasan Hamid (2016). Kemampuan Pembuktian, Berpikir Kritis, dan *Self-Efficacy* Matematis Mahasiswa melalui Model *Rigorous Teaching and Learning* (RTL) dengan Memanfaatkan Argumen Informal.

Tujuan dari penelitian ini adalah untuk menganalisis peningkatan kemampuan pembuktian (KP), berpikir kritis (BK), dan *self-efficacy* (SE) matematis mahasiswa dalam mata kuliah Analisis Real dengan menggunakan argumen informal melalui model *Rigorous Teaching and Learning* (RTL) dan yang mendapatkan pembelajaran konvensional (PK) berdasarkan kemampuan awal matematika (KAM) dan jalur masuk PTN. Metode yang digunakan dalam penelitian adalah quasi eksperimen dengan desain *pretest-posttest control group design*. Populasi dalam penelitian ini adalah mahasiswa Program Studi Pendidikan Matematika S1 pada salah satu LPTK di provinsi Maluku Utara, dan sampel dalam penelitian adalah mahasiswa Program Studi Pendidikan Matematika S1 FKIP Unkhair semester VII dan IX tahun akademik 2011/2012 dan 2012/2013. Hasil yang diperoleh dalam penelitian ini adalah: (1) Peningkatan KP, BK, dan SE matematis meningkat lebih baik berdasarkan KAM (tinggi, sedang, dan rendah) dan jalur masuk PTN (SNMPTN, SBMPTN, dan Mandiri) dalam belajar Analisis Real dengan model *Rigorous Teaching and Learning* (RTL) yang memanfaatkan argumen informal daripada pembelajaran konvensional (PK), (2) Terdapat perbedaan peningkatan KP matematis berdasarkan KAM (sedang dan rendah) dan jalur masuk PTN (Mandiri) dalam belajar Analisis Real dengan model *Rigorous Teaching and Learning* (RTL) yang memanfaatkan argumen informal lebih baik daripada pembelajaran konvensional (PK), (3) Terdapat perbedaan peningkatan kemampuan BK matematis berdasarkan KAM (sedang) dalam belajar Analisis Real dengan model *Rigorous Teaching and Learning* (RTL) yang memanfaatkan argumen informal lebih baik daripada pembelajaran konvensional (PK), (4) Terdapat perbedaan peningkatan kemampuan SE berdasarkan KAM (tinggi, dan sedang) dan jalur masuk PTN (SNMPTN dan SBMPTN) dalam belajar Analisis Real dengan model *Rigorous Teaching and Learning* (RTL) yang memanfaatkan argumen informal lebih baik daripada pembelajaran konvensional (PK), (5) Tidak terdapat pengaruh interaksi antara model *Rigorous Teaching and Learning* (RTL) dan model pembelajaran konvensional (PK) dengan KAM (tinggi, sedang, dan rendah) maupun jalur masuk PTN (SNMPTN, SBMPTN, dan Mandiri) terhadap peningkatan KP, BK, dan SE matematis mahasiswa, (6) 6) Terjadi peningkatan ketercapaian semua indikator kemampuan pembuktian, berpikir kritis, dan *self-efficacy* matematis meningkat lebih baik berdasarkan KAM (tinggi, sedang, dan rendah) dan jalur masuk PTN (SNMPTN, SBMPTN, dan Mandiri) dalam belajar Analisis Real dengan model *Rigorous Teaching and Learning* (RTL) yang memanfaatkan argumen informal daripada pembelajaran konvensional (PK).

Kata Kunci: Kemampuan Pembuktian Matematis, Berpikir Kritis Matematis, *Self-Efficacy* Matematis, Argumen Informal, Model *Rigorous Teaching and Learning*

ABSTRACT

Hasan Hamid (2016). Students' Mathematical Proof Ability, Critical Thinking, and Self-Efficacy through Rigorous Teaching and Learning (RTL) Model by Using Informal Argument.

The aim of this research is to analyze an increase in students' mathematical proof ability (PA), critical thinking (CT), and self-efficacy (SE) in the course subject of Real Analysis by using informal argument through Rigorous Teaching and Learning (RTL) model and an increase in students using the conventional instruction (CI) based on their initial mathematical ability (IMA) and state university entrance paths. It adopted quasi-experimental method with pretest-posttest control group design. The population consisted of undergraduate students of Mathematics Education Study Program in one of the teacher training and education institutes in North Maluku Province, and the sample comprised the seventh and ninth semester students of Mathematics Education Study Program of the Faculty of Teacher Training and Education at Unkhair for the academic year 2011/2012 and 2012/2013. The findings show that: (1) There was a greater increase in students' mathematical PA, CT, and SE based on their (high, medium, low) IMA and state university entrance paths (SNMPTN[1], SBMPTN[2], and *Mandiri*[3]) in learning Real Analysis with Rigorous Teaching and Learning (RTL) model using informal argument than that of those with conventional instruction (CI); (2) The increase of mathematical PA based on (medium and low) IMA and state university entrance paths (*Mandiri*) in learning Real Analysis with Rigorous Teaching and Learning (RTL) model using informal argument was greater than that of those with conventional instruction (CI); (3) The increase of mathematical CT based on (medium) IMA in learning Real Analysis with Rigorous Teaching and Learning (RTL) model using informal argument was greater than that of students with conventional instruction (CI); (4) The increase of students' SE based on (high and medium) IMA and state university entrance paths (SNMPTN and SBMPTN) in learning Real Analysis with Rigorous Teaching and Learning (RTL) model using informal argument was greater than that of students with conventional instruction (CI); (5) There was no effect of the interaction between Rigorous Teaching and Learning (RTL) model and conventional instruction (CI) model with both (high, medium, and low) IMA and state university entrance paths on student's increased mathematical PA, CT, and SE; and 6) There was a greater increase in the achievement of all indicators for mathematical proof ability, critical thinking, and self-efficacy based on (high, medium, and low) IMA and state university entrance paths (SNMPTN, SBMPTN, and *Mandiri*) in learning Real Analysis with Rigorous Teaching and Learning (RTL) model using

[1] Seleksi Nasional Masuk Perguruan Tinggi Negeri, National Selection of State University Entrance
[2] Seleksi Bersama Masuk Perguruan Tinggi negeri, Joint Selection of State University Entrance
[3] Independent University Entrance Exam

informal argument than that of the achievement of all indicators for students treated with conventional instruction (CI).

Keywords: Mathematical Proof Ability, Mathematical Critical Thinking, Mathematical Self-Efficacy, Informal Argument, Rigorous Teaching and Learning Model